Analysis of lard in cream cosmetics formulations using FT-IR spectroscopy and chemometrics.

ABSTRACT

Typically, cream preparation is composed from complex mixtures; therefore its analysis is rather difficult. The presence of lard (LD) in any personal care products is prohibited to be used by the Followers of Islam. In this study, Fourier transform infrared (FT-IR) spectroscopy combined with partial least square (PLS) and discriminant analysis (DA) was developed for the quantification and classification of LD in cream formulations. PLS and DA were performed at two frequency regions of 3,020 – 2,995 and 1,200 – 1,000 cm. 1 The PLS calibration model obtained for the relationship between actual (x-axis) and FT-IR predicted (y-axis) values of LD was y = 0.997x + 0.065, with coefficient of determination (R) and root mean square error of 2 calibration (RMSEC) of 0.997 and 0.808% (v/v), respectively. In addition, DA can successfully classify creams containing LD in its formulation using 9 principal components. FT-IR can be used as a potential analytical technique to quantify and to classify LD in cream preparations with total analysis time at about 3 min/one sample measurement.

Keyword: Lard; FT-JR spectroscopy; Cream cosmetics; Partial least square; Discriminant analysis.